Claims

1. In a system for managing a storage area network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

a first element that maintains a first representation of the SAN and that generates an event notification indicative of an event with respect to the SAN,

a second element in communication with the first element, the second element maintaining a second representation of the SAN and responding to the event notification by

accessing the first representation and

updating the second representation,

the second element responding to a discrepancy between the event notification and an attribute of any of the first and second representations by selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation.

2. In the system of claim 1, the improvement wherein

the SAN comprises a plurality of hosts, each coupled via a first network with one or more storage units, the hosts and storage units collectively comprising the components,

one or more agents each associated with one or more hosts, each agent generating a scan identifying attributes of any of (i) the host with which it is associated, (ii) a storage unit to which that host is coupled, and (iii) a relationship therebetween, and

the agents in communication coupling with the first element a transmitting the scan thereto.

3. In the system of claim 2, the improvement wherein the agents transmit the scans to the first element asynchronously with respect to one another.

4. In the system of claim 1, the improvement wherein the first representation comprises scans received from the one or more agents.

5. In the SAN of claim 3, the improvement wherein the hosts comprise digital data processors and the agents execute on the host digital data processors.

6. In the SAN of claim 4, the improvement comprising a manager digital data processor is coupled to the host digital data processors by via a second network, wherein the first and second element execute in connection with the manager digital data processor.

7. In the SAN of claim 1, the further improvement comprising functionality that recovers the second representation by any of

i) clearing the second representation and rebuilding that representation from attributes of the first representation,

ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation, and

iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

8. In a system for managing a storage area network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

a first element that maintains a first representation of the SAN and that generates an event notification indicative of an event with respect to the SAN,

a second element in communication with the first element, the second element maintaining a second representation of the SAN and responding to the event notification by

accessing the first representation and

updating the second representation,

the second element disregarding the event notification if any of

i) the event notification is indicative of addition of a new component to the SAN and an attribute of the first representation is indicative of absence of that component,

ii) the event notification is indicative of addition of a relationship between components of the SAN and an attribute of the first representation is indicative of absence of that relationship,

iii) the event notification is indicative of addition of a relationship between components of the SAN and an attribute of the second representation is indicative of the absence from the SAN of one of the components to that relationship,

iv) the event notification is indicative of a missing component of the SAN and an attribute of the second representation indicative of the absence of that component from the SAN,

v) the event notification is indicative of a missing component of the SAN and an attribute of the second representation indicates representation of that component in the second representation, but the absence of that component from the SAN,

vi) the event notification is indicative of a missing relationship between components of the SAN and an attribute of the second representation indicative of absence of that relationship in the second representation, or

vii) the event notification is indicative of a missing relationship in the SAN and an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the SAN.

9. In a system for managing a storage area network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

a first element that maintains a first representation of the SAN and that generates an event notification indicative of an event with respect to the SAN,

a second element in communication with the first element, the second element maintaining a second representation of the SAN and responding to the event notification by

accessing the first representation and

updating the second representation,

the second element responding to a discrepancy between the event notification and an attribute of any of the first and second representations by selectively recovering the second representation from one or more attributes of the first representation if any of

i) the event notification is indicative of addition of a new component to the SAN and an attribute of the first representation is indicative of the presence of that component,

ii) the event notification is indicative of addition of a relationship between components of the SAN and an attribute of the second representation is indicative of the presence of that relationship,

iii) the event notification is indicative of modification of an attribute of a component of the SAN and an attribute of the second representation is indicative of the absence from the SAN of that component, or

iv) the event notification is indicative of modification of an attribute of a component of the SAN and an attribute of the second representation indicative of inclusion of that component in the second representation but its absence from the SAN.

10. In a method of managing a storage area network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

maintaining a first representation of the SAN and generating event notification indicative of an event with respect to the SAN,

maintaining a second representation of the SAN and responding to the event notification by

accessing the first representation, and

updating the second representation,

responding to a discrepancy between the event notification and an attribute of any of the first and second representations by selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation.

11. In the method of claim 10, the further improvement wherein the recovering step includes any of

i) clearing the second representation and rebuilding that representation from attributes of the first representation,

ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation, and

iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

12. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a new component to the SAN, and

an attribute of the first representation indicative of absence of that component,

by disregarding the event notification.

13. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a new component to the SAN, and

an attribute of the first representation indicative of absence of that component,

by determining whether the component is in the second representation and, if so, updating the second representation to indicate that component's status is suspect.

14. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a new component to the SAN, and

an attribute of the first representation indicative of the presence of that component,

by performing a recovery operation on the second representation.

15. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a relationship between components of the SAN, and

an attribute of the first representation indicative of absence of that relationship`,

by disregarding the event notification.

16. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a relationship between components of the SAN, and

an attribute of the second representation indicative of the presence of that relationship,

by performing a recovery operation on the second representation.

17. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of addition of a relationship between components of the SAN, and

an attribute of the second representation indicative of the absence from the SAN of one of he components to that relationship,

by disregarding the event notification.

18. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of modification of an attribute of a component of the SAN, and

an attribute of the second representation indicative of the absence from the SAN of that component,

by performing a recovery operation on the second representation.

19. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of modification of an attribute of a component of the SAN, and

an attribute of the second representation indicating presence of representation of that component in the second representation but its absence from the SAN,

by performing a recovery operation on the second representation.

20. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of a missing component of the SAN, and

an attribute of the second representation the absence of that component from the SAN,

by disregarding the event notification.

21. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of a missing component of the SAN, and

an attribute of the second representation indicates inclusion of that component in the second representation, but the absence of that component from the SAN,

by disregarding the event notification.

22. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of a missing relationship between components of the SAN, and

an attribute of the second representation indicative of absence of that relationship in the second representation,

by disregarding the event notification.

23. In the method of claim 10, the further improvement wherein the responding step includes responding to

an event notification indicative of a missing relationship in the SAN, and

an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the SAN,

by disregarding the event notification.